User Guide

For Network Attached Storage

Ver.1.0.0.0710

(For ADM 1.0)

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1. Introduction

Thank you for choosing ASUSTOR network attached storage (NAS).

From cross-platform file sharing to multimedia server applications to App Central, ASUSTOR NAS provides you with a rich assortment of features, allowing you to explore the unlimited potential of NAS.

Your NAS comes preloaded with ASUSTOR Data Master (ADM), an operating system developed by ASUSTOR. ADM provides you with an intuitive and user friendly interface. This user manual will introduce you to all the preloaded applications (Apps) on your NAS.

Online Resources

Type	URL
Forum (English)	http://forum.asustor.com
Downloads	http://www.asustor.com/services/download
Technical Support	http://www.asustor.com/services/online_support

Terms of Use

All ASUSTOR products have undergone stringent and comprehensive testing. Under normal user operation and within the warranty period, ASUSTOR will assume responsibility for any hardware failures. Before using this product, please read the End-User License Agreement (EULA) located at the end of this user manual.

2. Pre-Installed Apps

Pre-installed Apps include the configuration of function and service settings for hard disks and hardware. You can configure everything from system related settings to user access rights.

2.1. Settings

2.1.1. General

Here you can manage the system HTTP port and auto logout settings. Auto logout will logout users if they remain idle past the specified period of time.

- System HTTP Port: This is used to specify the port you wish to use to connect to ADM's web based user interface. You can access your NAS by opening a web browser and entering your IP address followed by a colon and the specified port number.

  For example: http://192.168.1.168:8000

- Timeout timer: For security concerns, users that remain idle past the specified period of time after logging on will be automatically logged off.

2.1.2. Network

Note: This function may differ depending on the NAS model in use.

Here you can configure the server name, LAN and Wi-Fi settings. Other settings include IP address, DNS server and default gateway.

- Server Name: An online name for your NAS.
- Default Gateway: The default gateway that you wish to use.
- DNS Server: Here you can set the DNS server that you wish to use. Should you choose to obtain your IP address via DHCP the system will automatically obtain the available DNS servers for you. If you choose to manually enter an IP address then you will have to manually enter a DNS server as well.

  Reminder: Using an invalid DNS server will affect some network related functions. (i.e., Download Center). If you are uncertain about how to proceed, please choose to obtain your IP address automatically.

See More

NAS 105 – Networking: A Beginner's Guide

NAS 307 – Networking: Link Aggregation

2.1.3. Regional Options

Here you can adjust the settings for date and time, display format, time zone and daylight saving time.

2.1.4. Hardware

Note: This function may differ depending on the NAS model in use.

Here you can configure settings for the LED indicators, buzzer, hard disk hibernation, power usage, fan speed and LCD display panel.

- System: Here you can choose to disable any of the LED indicators to save power. By selecting "night mode", only the system power LED indicator will be enabled. It will flash an orange light every 10 seconds. You can also configure settings for the buzzer and reset button here.
- Disk: Your hard disks will enter hibernation mode when left idle for the period of time specified here.
- Power: Here you can manage power usage settings such as Wake-On-LAN (WOL) and power scheduling.
- Fan Control: Here you can set the rotation speed for the fan. If you are not sure about which speed to select, you can simply select Auto. This will automatically adjust the fan speed in accordance with the temperature of the system.
- LCD Panel: You can have the LCD panel display a customized scrolling message or the local temperature.

  Reminder: If you choose to display the local temperature, the system will use your current IP address to determine the temperature at your present location. The results of this may vary, depending on your exact location.

Reset Button

If for some reason you cannot connect to your NAS, this button can be used to return a portion of the settings to their default values.

- The system administrator account (admin) password will be reset back to "admin".
- The system HTTP and HTTPS ports will be reset back to 8000 and 8001 respectively.

- The system will revert to automatically obtaining an IP address. You can then use ASUSTOR Control Center to search for your NAS.
- ADM Defender will be reset and will allow all connections.

2.1.5. Notification

You can configure this setting to send you notification immediately in the event that the system encounters any problems.

- Send: Here you can set the accounts that will be used for sending e-mail or SMS notifications. Multiple accounts can be set up but only one may be used as the primary account.
- Receive: Here you can set up the accounts that will be used to receive e-mail and SMS notifications. You can also set the type of system notifications that will be received by these accounts.

2.1.6. ADM Defender

ADM Defender can protect your NAS from malicious Internet attacks, ensuring the security of your system.

- Firewall: Here you can block specific IP addresses or only allow specific IP addresses to access your NAS.
- Network Defender: After enabling this function, the client IP address will be blocked if there are too many unsuccessful login attempts within the specified time period. For example, in the graphic below, after a user has attempted 5 unsuccessful logins within a 10 minute time period, he/she will be blocked forever.

About Network Defender

Network Defender can protect you from malicious attacks and prevent hackers from trying to access your NAS. Supported protocols are as follows:

- ADM system login (HTTP & HTTPS)
- Windows File Service (CIFS/SAMBA)
- Apple Filing Protocol (AFP)

- File Transfer Protocol (FTP)
- Secure Shell (SSH)

2.1.7. ADM Update

Here you can obtain the latest version of ADM to ensure system stability and to upgrade software features.

- Live Update: After enabling Live Update, the system will notify you of any available updates when you log in to ADM.
- Manual Update: You can go to ASUSTOR's official website (http://www.asustor.com) to download the latest version of ADM.

2.1.8. Network Recycle Bin

When you enable Network Recycle Bin, the system will create a Recycle Bin "X" for each logical volume. For example, "Volume 1" will have a corresponding "Recycle Bin 1" created for it and "Volume 2" a "Recycle Bin 2". Any deleted files will then be moved to the Recycle Bin, letting you recover any accidentally deleted files.

About Network Recycle Bin

After enabling Network Recycle Bin, all files deleted via the following protocols will be moved to the Recycle Bin.

- Windows File Service (CIFS/SAMBA)
- Apple Filing Protocol (AFP)
- File Transfer Protocol (FTP)
- File Explorer

Once a Recycle Bin has been created, it cannot be removed.

2.1.9. Energy Saver

Energy Saver can help you to reduce power consumption when your NAS is inactive or being lightly used.

2.1.10. Ease of Access

Here you can configure all the necessary settings for remote access.

- Cloud Connect: Here you can obtain a Cloud ID for your NAS. By entering the Cloud ID into ASUSTOR client applications, you can access your NAS without having to enter the host/IP information.
- EZ-Router: Here you can set up your network router automatically for direct NAS access from any device with Internet access.

  Reminder: Your router must support UPnP/NAT-PMP. Please note that not all routers support automatic configuration. Please see the hardware compatibility list found on the ASUSTOR website for more information.
- DDNS: Here you can create or configure your DDNS account. DDNS allows you to use a persistent host name (i.e., nas.asustor.com) to connect to your NAS. You won't have to worry about remembering your NAS's IP address. This feature is often used in dynamic IP environments.

2.1.11. Factory Default

Here you can restore the system back to its factory default settings. After this, the system will return to its pre-initialized state. For security reasons, you will be asked to enter the administrator password before performing this operation. You can then initialize the system again through Control Center or by logging into ADM.

Warning: After the system is restored to its factory default settings, all previous settings and files will be permanently deleted. You will not be able to recover these settings and files. Please ensure that you have backed up the data on your NAS before you begin this operation.

2.1.12. Registration

Here you can sign up for a personal account (ASUSTOR ID) and register your product. Once the product has been registered, your ASUSTOR ID will be automatically enabled.

Reminder: A valid ASUSTOR ID is required for downloading any apps from the App Central or applying Cloud ID service.

2.2. Services

Here you can configure network related services such as FTP server, Web server and MySQL server.

2.2.1. Windows

After enabling Windows File Service, you can access your NAS via any Windows operating system (i.e., Windows 7). Windows File Service is also known as CIFS or SAMBA. If you are using Windows Active Directory (hereafter referred to as "AD"), you can add your NAS to your AD domain.

- Workgroup: This is the workgroup on your local area network that your NAS belongs to.
- Local Master Browser: After enabling this option, your NAS will, from your local area network, collect the names of all other computers in its workgroup.

  Reminder: Enabling this feature may prevent your hard disk(s) from going into hibernation.

About Windows Active Directory

After successfully adding your NAS to your AD domain, you can then configure access rights using the Domain Users, Domain Groups and Shared Folders settings found in the Access Control system app (see section 2.4 Access Control). AD users can then use their own AD accounts to log in and access the NAS.

See More

NAS 106 – Using NAS with Microsoft Windows

NAS 206 – Using NAS with Windows Active Directory

2.2.2. Mac OS X

After enabling Mac OS X file service, you can access your NAS via any Mac OS X operating system (i.e., Mac OS X v10.7). This file transfer protocol is called AFP (Apple Filing Protocol). You can also use Time Machine to back up data to your NAS.

- Apple Filing Protocol (AFP): This is the protocol used when transferring files between Mac OS X and local area networks. Go to the Finder and click "Go" in the Finder menu, then select "Connect to Server." This will bring up the Connect to Server dialog box. Here you can enter the IP address that you want to connect to.

  For example： afp://192.168.1.168

- Bonjour Service Name: Your NAS will be identified by this name in the Finder.
- Time Machine Support: Here you can enable Time Machine support and select the shared folder that you wish to back up to. If multiple Mac users wish to access this feature simultaneously, please see **NAS 159 – Time Machine: Best Practice** for guidance.

About Bonjour

Bonjour, also known as zero-configuration networking, has been widely used in Apple related products. It will scan your vicinity for other Apple devices and then let you directly connect to them without having to know their actual IP addresses.

After enabling this service, you will be able to see your NAS in the left hand panel of the Finder under "Shared". Simply click on your NAS to connect to it.

See More

NAS 108 – Using NAS with Apple Mac OS X

NAS 159 – Time Machine: Best Practice

2.2.3. NFS

After enabling NFS, you will be able to access your NAS via UNIX or Linux operating systems.

About NFS

After enabling NFS service, you can configure access rights using the Shared Folders setting found in the Access Control system app (see section 2.4 Access Control). This option will be hidden if NFS service has not been enabled.

2.2.4. FTP Server

After enabling the FTP server setting, you will be able to access your NAS via any FTP client program (i.e., FileZilla). FTP server access rights are the same as those for the system (ADM). Should you wish to change or configure these access rights, you may do so using the shared folders setting found in the Access Control system app (see section 2.4 Access Control).

- Unicode support: Please enable this option if your FTP client program supports Unicode.
- Enable anonymous: Enabling this option will allow FTP client programs to access your NAS anonymously, without the need for a username or password. For security reasons, this is not recommended.
- Enable SSL/TLS: Enable encryption for FTP connections.
- Maximum number of all FTP connections: The maximum number of simultaneous FTP connections allowed.
- Maximum number of connections per IP: The maximum number of connections allowed per IP or system.
- Max upload rate: The maximum upload speed per connection. 0 represents no limitation.
- Max download rate: The maximum download speed per connection. 0 represents no limitation.
- Passive FTP: To minimize the security concerns of connecting from a server to a client, a type of connection mode called Passive Mode (PASV) was developed. When a client program starts to connect, it will notify the server to activate Passive Mode.

About Passive FTP

Passive mode FTP can be used to overcome the problem of active mode FTP being blocked by firewalls. Passive FTP makes the FTP client establish all connections to the FTP server, as opposed to the web host supplying the return port. Firewalls typically allow passive FTP connections without requiring additional configuration information.

2.2.5. WebDAV

After enabling WebDAV you can access your NAS via HTTP or HTTPS protocol by using a Web browser or other client programs.

See More

NAS 208 – WebDAV: A Secure File Sharing Alternative to FTP

2.2.6. Web Server

ADM comes built-in with an independent web server (apache) that you can use to host your own website. After enabling this feature, the system will create a shared folder called "Web" that will serve as the web server's root directory.

- PHP register_globals: This feature is not enabled, by default. Enable this if a website program specifically requests you to. Otherwise, it is recommended that you leave this feature disabled for system security reasons.

- Virtual Host: You can use this feature to simultaneously host several websites on your NAS.

See More

NAS 321 – Hosting Multiple Websites with a Virtual Host

2.2.7. MySQL Server

ADM comes pre-installed with MySQL, which you can use for website databases.

Reminder: You can manage your MySQL server with phpMyAdmin which can be downloaded and installed from App Central.

- Reset Password: If you happen to forget your MySQL login password, you can reset the password for the "root" account (The default password is "admin"). This is also the default administrator account.

- Reinitialize Database: Here you can reinitialize your entire MySQL database. Upon reinitialization, all of your MySQL databases will be erased.

About MySQL

For the MySQL administrator account, the default username is "root" and the default password is "admin". For security reasons, please remember to change the password for this account.

2.2.8. Terminal

You can enable SSH service if you wish to manage your NAS over Secure Shell (SSH). If you wish to transfer data to your NAS through SFTP (Secure FTP) you can enable that here as well.

Note: For security reasons, SSH only allows the "admin" account or the "root" account to log in. The passwords for both these accounts are identical.

2.2.9. Rsync Server

After enabling Rsync server, your NAS will become a backup server and will allow remote backup from another ASUSTOR NAS or any other Rsync-compatible servers.

- Enable Rsync server: If you wish to permit encrypted backup for clients, please enable support for encrypted transmission via SSH. If you enable this feature the system will then automatically enable SSH service (2.2.8 Terminal).

- Manage Rysnc User: If you wish to create restrictions on the Rsync connections that can back up to your NAS, please click on **Manage Users** to create different Rsync user accounts.

  Reminder: Rsync accounts are different and independent from system accounts.

- Add New Backup Modules: Click on **Add** to create a new backup module. Each backup module will then correspond to a physical path within the system. When an Rsync client connects to your NAS, it will be able to select a backup module. Data will then be backed up to the module's corresponding physical path.

See More

NAS 259 – Using Remote Sync (Rsync) to Protect Your Data

NAS 351 – Remote Sync (Rsync): Best Practice

2.3. Storage Manager

2.3.1. Volume

Note: This function may differ depending on the NAS model in use.

Storage space on your NAS consists of logical volumes which are made up of a single disk or multiple disks combined together. Here you can set up new storage space for your NAS and, according to your data protection needs, select the most suitable RAID level. In order to maintain data integrity, you may only use internal disks when creating storage space for your NAS. ADM does not support the use of external disks for storage space.

Reminder: The RAID levels that you may employ will depend on your NAS product model and the number of disks that you are using.

When setting up new storage space, ADM offers the following two options:

- Quick Setup: You need only specify the requirements for the storage space (i.e., you wish to have a higher level of data protection). Based on this and the number of disks you have, ADM will automatically create a storage volume and select an appropriate RAID level for it.

- Advanced Setup: Based on the current number of disks, you can manually select a RAID level or set up a spare disk.

Reminder: In order to optimize disk space utilization, it is recommended that you use disks of the same size when creating storage space.

About RAID

In order to provide optimal storage space utilization and data protection, ADM supports multiple RAID levels allowing you to select the appropriate level for your needs. The following RAID levels are all supported by ADM:

- **Single:** Only uses a single disk in the creation of storage space. This configuration does not offer any type of data protection.

- **JBOD:** Uses a combination of two or more disks to create storage space. The total storage capacity is the capacities of all the disks added together. The advantage of this configuration is that it allows you to use different sized disks together and provides a large amount of storage space. The downside is that it does not offer any sort of data protection and has an access efficiency lower than RAID 0.

- **RAID 0:** Uses a combination of two or more disks to create storage space. The total storage capacity is the capacities of all the disks added together. The advantage of this configuration is that it allows you to use different sized disks together and provides a large amount of storage space. The downside is that it does not offer any sort of data protection.

- **RAID 1:** In RAID 1 your data is written identically on two disks, thereby

producing a "mirrored set". Exactly the same data is stored on the two disks at all times. RAID 1 protects your data from loss should one of your disks fail. RAID 1's advantage is that it offers protection for your data by providing data redundancy. The downside of this configuration is that when combining two disks of differing sizes, the total storage space will be equal to the size of the smaller disk. Therefore, you will be unable to use a portion of the larger disk.

Total available storage space = (size of smaller disk) * (1)

- **RAID 5:** Combines three or more disks to create a storage space that is able to support one failed disk. Should one of your disks fail, your data will still be protected from loss. In the event of disk failure, simply replace the failed disk with a new one. The new disk will automatically be accommodated into the RAID 5 configuration. The advantage of using RAID 5 is that is that it provides data protection through data redundancy. The downside to using RAID 5 is that when combining disks of differing sizes, the total storage space will be calculated based on the size of the smallest disk.

  Total available storage space = (size of smallest disk) * (total number of disks – 1)

- **RAID 6:** Combines four of more disks to create a storage space that is able to support two failed disks. Should two of your disks fail, your data will still be protected from loss. In the event of disk failure, simply replace the failed disks with new ones. The new disks will automatically be accommodated into the RAID 6 configuration. The advantage of using RAID 6 is that it is able to provide superior data protection through data redundancy. The downside to using RAID 6 is that when combining disks of differing sizes, the total storage space will be calculated based on the size of the smallest disk.

  Total available storage space = (size of smallest disk) * (total number of disks – 2)

- **RAID 10 (1+0):** Combines four or more disk to create a storage space that is able to support multiple failed disks (as long as the failed disks do not belong to the same "mirrored set"). RAID 10 provides the data protection of RAID 1 along with the access efficiency of RAID 0. With respect to data protection, RAID 10 uses the RAID 1 method of having the exact same data written identically on two disks, producing "mirrored sets". These "mirrored sets" are then combined together in a RAID 0 configuration. RAID 10 requires an even number of four or more disks. When combining disks of differing sizes, the total storage space will be calculated based on the size of the smallest disk.

  Total available storage space = (size of smallest disk) * (total number of disks / 2)

See More

NAS 251 – Introduction to RAID

NAS 352 – Online RAID Level Migration and Capacity Expansion

2.3.2. Disk

Here you can check on the status of all your disks. You can also inspect their S.M.A.R.T. information and conduct tests on your disks.

- S.M.A.R.T. Info: S.M.A.R.T. is an acronym for Self-Monitoring Analysis and Report Technology. It is a type of self-monitoring mechanism for disks that detects and reports on various indicators of reliability, with the hope of anticipating failures.
- Disk Doctor: Here you can check your disks for bad sectors or conduct S.M.A.R.T. tests.

2.3.3. iSCSI

iSCSI is a type of network storage technology that offers high expandability and low implementation costs. Through existing network infrastructure and iSCSI you can use your NAS to expand existing storage space or have it act as a backup destination. iSCSI consists of two ends, a target and an initiator. The initiator is used to search for iSCSI hosts and to set up targets.

- IQN: IQN (iSCSI Qualified Name) is the unique name for each iSCSI target. This name should not be the same as any of the other target IQNs on other hosts.
- CHAP Authentication: CHAP authentication can be used to verify a user's identity. If you choose to use CHAP authentication, a CHAP password must first be entered from the initiator for verification before it can connect to the target.
- Mutual CHAP Authentication: Mutual CHAP authentication requires both the target and the initiator to have usernames and passwords. When establishing a connection, the target and the initiator will have to authenticate each other using their respective credentials.
- LUN Pool: Here you can check on the status of all iSCSI LUNs and assign corresponding iSCSI targets.

See More

NAS 308 – Introduction to iSCSI

2.4. Access Control

2.4.1. Local Users

Here you can manage (add, edit or remove) the local users in the system and assign their access rights to shared folders.

Reminder: If you only have a few users on the system, you can set up the access rights for each of them one by one.

Within ADM, a single user's access rights with regards to shared folders will depend on the user's existing access rights and on the access rights of the group that the user belongs to. Both sets of access rights will be checked against each other in order to determine priority (please see Appendix 4.1). For convenience, the system provides a preview mode which allows you to first preview any changes that you make to access rights.

About Local Users

After initialization, the system will automatically create user accounts for "admin" and "guest". "admin" is the default administrator account and possesses a majority of the access rights. If you wish, you can change the access rights and password for this account. "guest" is the default guest account which is only suitable for use with CIFS/SAMBA and AFP. This account does not possess login and authentication rights, so you cannot change its password.

See More

Appendix 4.1 – Permission Mapping Table

2.4.2. Local Groups

Here you can manage (add, edit or remove) the local groups in the system and assign access rights for shared folders.

Reminder: If you have a relatively large number of users on the system, you can conveniently assign access rights by user group instead of assigning access rights for each user one by one.

Within ADM, a single user's access rights with regards to shared folders will depend on the user's existing access rights and on the access rights of the group that the user belongs to. Both sets of access rights will be checked against each other in order to determine priority (please see Appendix 5.1). For convenience, the system provides a preview mode which allows you to first preview any changes that you make to access rights.

About Local Groups

After initialization, the system will automatically create two user groups, "administrators" and "users". "administrators" is the default administrator group. If a user is added to this group, they will possess a majority of the administrator access rights. The "admin" account belongs to the "administrators" group by default and cannot be removed from it.

See More

Appendix 4.1 – Permission Mapping Table

2.4.3. Domain Users

Here you can view all AD user accounts and manage their access rights to shared folders once your NAS has been successfully added to an AD domain.

Reminder: ASUSTOR NAS can support more than 200,000 AD users and groups. When joining an AD domain for the first time, depending on the number of users and groups, it may take a while for all of them to become visible.

See More

Appendix 4.1 – Permission Mapping Table

2.4.4. Domain Groups

Here you can view all AD user groups and manage their access rights to shared folders once your NAS has been successfully added to an AD domain.

Reminder: ASUSTOR NAS can support more than 200,000 AD users and groups. When joining an AD domain for the first time, depending on the number of users and groups, it may take a while for all of them to become visible.

See More

Appendix 4.1 – Permission Mapping Table

2.4.5. Shared Folders

Here you can manage your shared folders and set up their access rights in relation to users and user groups. Shared folders allow your NAS to become a file server. They are fundamental in sharing files with the outside world. Consequently, correctly setting up their access rights is very important in the management of your data.

- Invisible in "Network" or "My Network Places": This setting only applies if you are using Microsoft Windows. When you enable this setting, your NAS will cease to automatically appear in "Network" or in "My Network Places". Please note that enabling this setting will not affect the connection to your NAS in any way.

- Encrypt this shared folder: Here you can choose whether or not you want to encrypt your shared folder and whether or not you want to auto-mount it at system startup. Should you choose to encrypt your folder, after the system restarts, you will have to manually enter the password for the folder in order to access it. Encrypted folders are normally used for the storage of critical or confidential data. Should you lose your NAS you still needn't worry about your data leaking out and falling into the wrong hands.

  Reminder: You can choose to enable or disable encryption for folders even after they have been created. Encryption is available for use with all shared folders and is not just limited to system default folders. The access speed for encrypted folders will normally be slower than for unencrypted folders.

  Warning: When choosing to use encrypted shared folders, please make it a point to remember your password. Should you forget your password, the data in the shared folder will become unrecoverable.

- NFS Privileges: Here you can set NFS privileges for individual folders after first enabling NFS service.

About Shared Folders

After initialization, the system will automatically create a shared folder "public". By default, all users can access the files in this folder. Additionally, the system will automatically create a personal folder for each user (using the user's account name) that by default, can only be accessed by the mentioned user.

See More

Appendix 4.1 – Permission Mapping Table

2.4.6. App Privileges

Here you can configure the users' or user groups' access rights to apps. For example, if a particular user's account is denied access to the Surveillance Center app, once he/she logs in, he/she will not be able to see the Surveillance Center app icon on their ADM home screen. The user will have no way of opening or accessing the app.

- Web applications may be public in nature (i.e., WordPress) or have their own account management systems (i.e., Joomla). Therefore, there is no way to restrict access to them through ADM.

- With regards to domain users, the system only offers the option of setting their File Explorer access rights.

2.5. Backup & Restore

2.5.1. Remote Sync

Remote Sync (Rsync) can allow your NAS to be used as a backup destination or backup source. When using your NAS as a backup source, you can choose to back up the data from your NAS onto another remote ASUSTOR NAS or Rsync compatible server. When your NAS acts as a backup destination, you can back up the data from another remote ASUSTOR NAS or Rsync compatible server onto your NAS.

Reminder: If you wish to use Remote Sync while using your NAS in conjunction with another remote ASUSTOR NAS, please remember to enable the Rsync server feature on the remote NAS (Services -> Rsync Server). For more information please see Rsync Server 2.2.9.

- Use encrypted transmission: If you choose to use encrypted transmission, you will have to enter the other host's SSH connection information in addition to your Rsync account information.

- Use 1 on 1 folder synchronization: If you decide to use 1 on 1 folder synchronization, all the data in the designated destination folder will be synchronized with the data in your source folder (you may only select one folder). The contents of both folders will be exactly the same. If you decide not to use this feature, all your chosen source folders (you may select multiple folders) will be copied one by one to the destination folder.

- Keep extra files at the destination: Once the copying and synchronization of files is completed, the data at the source and destination should be exactly the same. However, sometimes there are extra files present at the destination. These files are only present at the destination but not at the source. By enabling this option, these extra files will be kept at the destination and will remain untouched.

- Archive mode (incremental backup): After enabling this feature, successive backup jobs (after your first backup job) will only copy the data that has changed since your last backup job (block level). For example, if you have made some small changes to a 10 MB file, incremental backup will only copy the portions that you have made changes to. This can significantly reduce bandwidth usage.

- Compress data during the transfer: During backup you can compress the data that is being transferred thereby lowering bandwidth usage.

- Keep file metadata: When you enable this option, certain file properties (permissions, extensions, attributes, owner, groups, etc.) will be sent along with the file to the destination.

- Support sparse files replication: You will only need to enable this option when the data that you wish to back up contains sparse files. Normally, you will not have to enable this option.

See More

NAS 259 – Using Remote Sync (Rsync) to Protect Your Data

NAS 351 – Remote Sync (Rsync): Best Practice

2.5.2. FTP Backup

FTP backup can allow for your NAS to be used as a backup destination or backup source. When using your NAS as a backup source, you can choose to back up the data from your NAS onto another remote ASUSTOR NAS or FTP server. When your NAS acts as a backup destination, you can back up the data from another remote ASUSTOR NAS or FTP server onto your NAS.

Reminder: If you wish to use FTP backup while using your NAS in conjunction with another remote ASUSTOR NAS, please remember to enable the FTP server feature on the remote NAS (Services -> FTP Server). For more information please see FTP Server 2.2.4.

About FTP Backup

Normally, FTP backup is suitable for use with a majority of FTP servers. However, incompatibility issues do arise from time to time. Therefore, it is recommended that you use two ASUSTOR NAS units to execute your backup jobs.

2.5.3. Cloud Backup

Note: This function may differ depending on the NAS model in use.

Using Cloud Backup, you can schedule regular backups of your NAS data to a cloud storage space or back up the data from a cloud storage space onto your NAS. Currently supported cloud storage services are as follows:

- Amazon S3

2.5.4. External Backup

Here you can choose to backup data from USB or eSATA external hard disks to your NAS or backup data from your NAS to these external hard disks. In addition to supporting two-way backup, this feature also supports scheduled backups, making sure that your data is always backed up.

2.5.5. One Touch Backup

Note: This function may differ depending on the NAS model in use.

One Touch Backup allows you to preset the function of the USB backup button found on the front of your NAS. Here you can designate your preferred backup direction and directory. After setting up One Touch Backup and plugging in an external USB drive to your NAS, you will only have to push the USB backup button to execute your backup job.

- Transfer Modes:
  - From USB device to NAS: The system will back up the entire contents of the USB drive, based on the existing directory structure, to the NAS folder path that you set.
  - From NAS to USB device: The system will take the contents of the specified NAS directory and, based on the existing directory structure, back it up to the USB drive's root directory.
- Backup Methods:
  - Copy: If you select this method, your system will copy your data from the back up source to the destination, be it the USB device or your NAS. Files or folders of the same name will be replaced and extra files at the destination will be kept. This method is suitable for one time backups.
  - Synchronization: If you select this method, all the data in the designated destination folder will be synchronized with the data in your source folder. The contents of both folders will be exactly the same. Extra files at the destination will be automatically deleted. This method is suitable for ensuring your most recent data is backed up and for scheduled weekly backups. For example, you may choose to have regularly scheduled backups of your NAS's data so you always keep a USB drive plugged into your NAS for this purpose.
  - Save in new folder: After selecting this method, you will then have to specify a naming format for the new folder. Every time you run a backup job the system will create a new folder according to this format and then proceed to back up your data into the folder. This method is suitable for those who wish to keep complete copies of each backup job, or those who just wish to back up their regular data from external devices onto their NAS. For example, you may back up the data from your work computer onto your USB drive and then proceed to back up the data from your USB drive onto your NAS at home.

About One Touch Backup

Once the USB backup button is held down for 1.5 seconds, One Touch Backup will be triggered. During the backup process, the USB backup LED indicator light will blink continuously. After the backup process has finished, the light will cease to blink and will then return to its previous state. If you wish to disable One Touch Backup, you can

adjust the settings accordingly.

2.5.6. System Settings

Here you can export or restore system settings in .bak format (file extension). This feature also supports scheduled backup, which means that you can create scheduled backup jobs and then export the settings to a specified location on your NAS.

2.6. App Central

Note: This function may differ depending on the NAS model in use.

You can use App Central to download apps that are suitable for use with your NAS. App Central provides you with a rich variety of applications, allowing you to install software that is uniquely suited to your needs. Whether your interests lie in digital entertainment, e-commerce, blogging or website construction, App Central has it all.

- Before you begin downloading, you must first register and log in with a valid ASUSTOR ID. Please see Registration 2.1.12 for more information.
- All newly installed apps will be immediately enabled after installation has finished.
- Should you choose to remove an app, all settings and information relating to the app will be removed as well. If you wish to reinstall the app at a later date, the system will not be able to return the app to its previous state with all of its previous settings and information still intact.

About App Central

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2.7. External Devices

2.7.1. Disk

Here you can view and format all USB or eSATA external hard disks that are connected to your NAS. Supported file systems are as follows:

- FAT32: for use with Windows and Mac OS X
- NTFS: for use with Windows
- HFS+: for use with Mac OS X
- EXT4: for use with Linux

Reminder: If your device cannot be detected, please try connecting again using another cable or port.

2.7.2. Printer

Here you can view all the USB printers that are connected to your NAS and their respective printing logs. Additionally, ASUSTOR NAS also supports Apple AirPrint.

Reminder: ASUSTOR NAS supports up to three USB printers.

- Management: Here you can activate and configure device names for AirPrint. You can send printing instructions from your Apple mobile device to your printer when they are part of the same local area network as your NAS.
- Clear All Waiting Jobs: Here you can choose to cancel all waiting print jobs.

2.7.3. Wi-Fi

After connecting your USB Wi-Fi adapter to your NAS, you can view its detailed information here.

About Using Wi-Fi with your NAS

If you wish to use Wi-Fi with your NAS, please take a look at the compatibility list on the ASUSTOR website before purchasing a Wi-Fi adapter. Wi-Fi signal strength and stability will vary according to the hardware that you are using (e.g., Wi-Fi network card and wireless access point) and any physical barriers that are present. Therefore, ASUSTOR has no way of guaranteeing Wi-Fi signal strength or stability. For best

results, a wired Ethernet connection is recommended.

2.7.4. UPS

A UPS can provide backup power to your NAS in the event of a power outage. Using a UPS can protect your data and NAS from sudden shutdown or service interruptions.

- Network UPS: Here you can setup your NAS to be the network UPS server (Master mode) and set its IP address, when the UPS's USB cable is connected to your NAS. Other devices that are in the same local area network will be then set to slave mode. In the event of a power outage, the master and slave devices will immediately detect this stoppage in power and then determine whether or not to commence shutdown procedures based on the time period that has been set.

2.8. System Information

2.8.1. About This NAS

Here you can view general information about your NAS such as the hardware model number, software version, and present state of the system.

2.8.2. Network

Here you can review information about your network settings (i.e., IP address and MAC address).

2.8.3. Log

Here you can review logs of all system events. These logs include the system log, connection log and file access log. ASUSTOR NAS also supports Syslog. This can allow you to employ centralized management by sending your system event information to a Syslog server.

- System log : All log entries about system events
- Connection log : All log entries about system connections.
- File access log : All log entries about file access.

2.8.4. Online Users

Here you can view the users that are currently logged in to ADM or any users that are using other transfer protocols to connect to your NAS.

About Online Users

ADM is able to display any users who connect to your NAS using the following methods:

- ADM system login (HTTP & HTTPS)
- Windows File Service (CIFS/SAMBA)
- Apple Filing Protocol (AFP)

- File Transfer Protocol (FTP)
- Secure Shell (SSH)
- iSCSI
- WebDAV

2.8.5. Dr. ASUSTOR

Dr. ASUSTOR performs checkups based the current state of your system, settings and connectivity. After performing these checkups, Dr. ASUSTOR will diagnose any problems and provide you with appropriate recommendations.

2.9. Activity Monitor

Note: This function may differ depending on the NAS model in use.

Activity Monitor dynamically monitors your NAS. Here you can view current usage information such as:

- CPU Usage
- Memory (RAM) Usage
- Network Traffic
- Storage Space Usage
- Resources Being Used by System Programs

2.10. File Explorer

File Explorer comes pre-installed with ADM and can be used to browse and manage the files on your NAS. File Explorer displays accessible directories to users based on the access rights that are assigned to them. Additionally, ADM supports three simultaneously open File Explorer windows. You can easily make copies of files by dragging and dropping them into a different File Explorer window.

- ISO Mounting: You no longer need to burn ISO files onto CDs in order to read them. Now you can select ISO files from your NAS and directly mount them to shared folders ("read only" access rights). You can then use your computer to access and read them. Later, when you are finished with the files, simply unmount them.

- Share Link: You can use Share Links to share files with people who don't have accounts on your NAS. Share Links allow you to instantly create download links for designated files that you want to share. Expiry dates can also be set for each Share Link that you create, allowing for safe and flexible management.

3.From App Central

In addition to the built-in apps that come with ADM, every ASUSTOR NAS comes with several pre-installed apps. You can choose whether you want to keep or remove these apps. At your convenience, you can also browse through and download any additional apps that peak your interest from App Central.

3.1. Download Center

Download Center allows you to easily download and save files to your NAS. Your NAS can effectively replace your computer in helping you with any download jobs. This provides you with data protection and energy saving benefits. An ASUSTOR NAS consumes far less power during operation than a normal computer does. No longer will you have to leave your computer on for long periods of time while downloading files. Download Center supports HTTP, FTP, and BitTorrent downloads along with the scheduling of download tasks and the limiting of download and upload speeds.

Furthermore, Download Center supports selective downloading with respect to BitTorrent downloads. This gives you the ability to select and download only the files that you wish to from within a torrent. You no longer need to waste bandwidth and storage space downloading unnecessary files that you don't want. Finally, you can remotely control Download Center using our exclusive mobile app (iOS and Android).

- BitTorrent Downloads: When you upload torrent files to Download Center, the system will automatically create a new download task and then proceed to add this task to the download list. Download Center also supports directly inputting the torrent's download link as well as the use of magnet links.

- HTTP/FTP Downloads: Download Center supports HTTP and FTP downloads. You only need to paste or enter the link of your choice. The system will then immediately begin your download.

- RSS Subscriptions and Downloads: RSS downloading (also known as Broadcatching) is a type of technology that allows you to select the items you wish to download from within the contents of RSS feeds. Additionally, Download Center also offers an RSS automatic downloader. In accordance with your settings, the system will regularly update RSS feeds and then proceed to download items based on your set keywords and preferences. This is frequently used with items that require regular downloading. For example, weekly TV shows.

- Search: Download Center allows you to use keywords to search for files that you wish to download.

See More

NAS 162 – Introduction to Download Center

NAS 265 – Automating Download Center

3.2. Surveillance Center

Surveillance Center allows you to manage an array of IP cameras and features Live View and Playback functions. All video recorded from IP cameras can be directly and safely stored on the NAS. Using Surveillance Center's exclusive playback interface you can review previously recorded video at any time.

Surveillance Center also supports several different recording modes such as schedule, motion detection and alarm trigger. Additionally, you also have the option of receiving notification in response to specific events. Notifications are sent by either SMS or e-mail.

- Settings: The installation wizard will guide you through the simple process of setting up Surveillance Center. You will be able to add new cameras, set video formats, and schedule recording times. You are also able to add new cameras or make changes to your original settings at any time.

- Live View: Here you can view live feeds from all cameras that have been set up. You can also control and monitor camera functions such as PTZ (pan, tilt, zoom), preset points, snapshots, manual recording and sound controls.

- Playback: You can simultaneously play back previously recorded video from multiple cameras. Should you discover any unusual events, you can use the Snapshot or Export functions to transfer the selected images or video to a local computer.

See More

NAS 161 – Introduction to Surveillance Center

NAS 261 – Advanced Setup for Surveillance Center

3.3. UPnP AV Media Server

The UPnP AV Media Server app can turn your NAS into your home's multimedia streaming server. As long as you have devices that support UPnP or DLNA (for example, SONY BRAVIA TV or PlayStation3®), you can directly browse and stream the pictures, music and videos stored on your NAS.

Additionally, you can use UPnP/DLNA compatible applications on your mobile device (for example, a notebook, iPhone or iPad) to stream multimedia files from your NAS.

- You only need to have your multimedia files stored in the shared folders "Media" or "Music" to be able to broadcast them. UPnP Multimedia Server will automatically scan designated directories for supported multimedia files.

- UPnP AV Multimedia Server currently only supports on-the-fly transcoding for photos and music.

Reminder: The media formats that are playable may vary between devices.

About UPnP AV Multimedia Server

UPnP AV Multimedia Server supports the following file formats:

- Video: 3GP, 3G2, ASF, AVI, DAT, FLV, ISO, M2T, M2V, M2TS, M4V, MKV, MPv4, MPEG1, MPEG2, MPEG4, MTS, MOV, QT, SWF, TP, TRP, TS, VOB, WMV, RMVB, VDR, MPE

- Audio: 3GP, AAC, AC3, AIFC, AIFF, AMR, APE, AU, AWB, FLAC[1], M4A, M4R, MP2, MP3, OGG Vorbis[1], PCM, WAV, WMA

- Photo: BMP, GIF, ICO, JPG, PNG, PSD, TIF, RAW Image[1] (3FR, ARW, CR2, CRW, DCR, DNG, ERF, KDC, MEF, MOS, MRW, NEF, NRW, ORF, PEF, PPM, RAF, RAW, RW2, SR2, X3F)

[1] You must first enable real time transcoding for these files in order to play them.

See More

NAS 168 – Your Home Media Center

3.4. iTunes Server

The iTunes Server app can turn your NAS into your home's audio and video streaming center. It allows you to share music and movies from your NAS with computers in the same network environment.

- After enabling the iTunes server app and adding music files to the "Music" shared folder, open iTunes on your PC or MAC. You will see your NAS under the "Shared" heading in the left hand panel of the iTunes window. Click on it to begin browsing and streaming your music.
- If you wish to restrict clients' access to your music, you can set up a password from within the iTunes Server app.
- iTunes Server supports pairing with the iOS Remote app.

Reminder: Music files that are newly added to your NAS may not immediately appear inside iTunes. This is because the iTunes Server app scans your directories for new music at regularly scheduled intervals. Rest assured that all newly added music files will eventually appear inside of iTunes.

About iTunes Server

iTunes Server supports the following file formats:

- Audio: AIF, M4A (AAC & Apple Lossless), M4P, M4R, MP3, WAV
- Playlist: M3U, WPL
- Video: M4V, MOV, MP4

See More

NAS 165 – Introduction to iTunes Server

4.Appendix

4.1. Permission Mapping Table

Y \ X	Deny	Read & Write	Read Only	No Settings
Deny	Deny	Deny	Deny	Deny
Read & Write	Deny	Read & Write	Read & Write	Read & Write
Read Only	Deny	Read & Write	Read Only	Read Only
No Settings	Deny	Read & Write	Read Only	Deny

X: User access rights for shared folders

Y: Group access rights for shared folders

Priority of access rights: Deny Access > Read & Write > Read Only > No Settings

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b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

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